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App F IX 4

1924. File No 178-24

Previous References (me) ✓ Serial Nos 1

me 188-2283 1-2
" 111-25 " 6217
" 91-17 & 3.4.9.14.19
23.26 & 32
117 23 " 2123
Later references

Preserve

GENERAL AND REVENUE SECRETARIAT

Serial Nos

Part B for March 26

SUBJECT

Note on the drainage scheme of Bangalore

Recorded with no orders

45
29/5/24

1253

(H R S III—3]

Routine Notes

[To be used only for notes, requisitions, etc, not intended for permanent record]

DEWAN'S OFFICE
RECEIVED ON 25 AUG 1924
Reg No 1509

A Note on the drainage Scheme of the Bangalore city is submitted as directed by the L. C. Secy

Yes JJK
23-8-24 (Land Revenue)
23
3 Dewan

4 The Scheme should require very careful study Committee a committee be appointed by Govt to
5 There is the duty to lay
6 These Committee

Q Are these necessary?

VL
23/8

84
26 8

7 Nee 8 25

N B —Should routine notes be written on small slips the notes must be copied or slips pasted on this form

GRS III—3]

125%

1250

Routine Notes

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regarding the 40 Rs Co Lakhs estimate for
is hereinto put up
29/8/24

OFFICE OF CHIEF ENGINEER FOR IRRIGATION
Regd No 3019
8 SEP 1924

& forwarded respectfully to the Hon'ble No no 244
Chief Engineer of Mysore for favour of my 4-9-24.
opinion
Pay under.

Secretary
Local Govt Secy

B/3078

B/4/1

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the notes must be copied or slips pasted o
this form

G.R.S III—3]

Routine Notes

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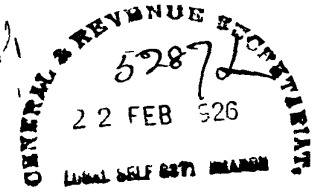

9 Returned, with compliments, to the Secretary to Government, Local and Legislative Departments with reference to correspondence ending with his D.O. letter No.L.5568 dated the 8th February 1926.

2. A copy of Mr.Marker's Note dated the 21st September 1925 is herewith attached.

3. I have nothing further to add to my previous note on the scheme (vide flag A in the file).

6 2 26

Chief Engineer of Mysore.

Bangalore
16 February 1926.

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BANGALORE CITY DRAINAGE SCHEME

12 The above note of the Chief Engineer is submitted for orders with reference to the Dewan's orders in paras 4 to 6 of the notes

13 On the experience gained by him while in charge of the drainage works

Routine Notes

[To be used only for notes, requisitions, etc, not intended for permanent record.]

in the Mysore City, Mr Parker has given his opinion on the two important points of the Drainage Scheme prepared by Mr D'Cruz, late Executive Engineer for the Bangalore City The two important points noticed by him in the scheme are (1) flushing, and (2) method of lifting the sewage

14 As regards flushing, Mr D'Cruz has provided for the use of waste waters under public fountains for flushing Mr Parker is of opinion that it is a good idea to make use of waste waters in this way, but in addition to this, a regular flushing is also required, that his experience in Mysore, where such flush tanks were erected under public fountains, goes to show that they do not serve the purpose well This may not be possible for some time to come considering the difficulty of water supply even for drinking purposes

15 As regards the second point, viz, method of lifting the sewage, Mr D'Cruz

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decided upon having one outfall - Mr Parker is of opinion that, for -- compactness of the scheme and from a health point of view, one common outfall is the best in preference to - having several outfall works which -- are sure to fall into disrepairs - - owing to the neglect of the Municipality as was the case at Mysore and that for lifting of the sewage from those portions which cannot gravitate to the common outfall, Shone's - ejectors as suggested by Mr D'Cruz may be adopted In this connection Mr Parker suggests that the Municipalities of Bombay, Karachi and Rangoon, wherein these ejectors are being made use of may be consulted as to the suitability and the working - of these ejectors, before this scheme is finally adopted

11 With a view to make a drainage scheme to be successful, Mr Parker says that the following points are - of vital importance -

(1) Flushing, (2) internal - - drainage of the houses and (3) Management and upkeep, and he wants - that these items should be carried

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5267

GRS III—3]

Routine Notes

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viz , (1) an adequate water supply - to flush the sewers, (2) a legislation empowering the Municipal Councils compelling the house owners to bring out the waste waters of their houses through impervious drains, - and (3) employment by the Municipality of a technical officer to look -- after and maintain the complicated - sewerage system

DE ... OI ...
RECD ON 12 ... 1926
File No 6267

He adds he would hesitate to -- launch such a costly measure whose - beneficial effect could hardly be -- compared with the enormous sum to be spent on it

See as can talk Sphere ... engineer ... is interested

6/12

The Chief Engineer Mr Bhore -- refers to his note previously prepared by him on the scheme of Mr D'Cruz
I says he has nothing further to add
Submitted for orders

L A Dewan

10/12/26

Submitted with reference para 4 above

Dewan

8/1/27

10/12/26

8/1/27

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Routine Notes

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G R S III—3]

Routine Notes

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NOTE ON BANGALORE SEWERAGE SCHEME. me178-24-1

1 The scheme is prepared by Mr. D'Cruz, the late Executive -- Engineer, Mysore Public Works Department, who had prepared a similar Scheme for Mysore City

2 The scheme is prepared on the latest ideas for such schemes and practically all details have been worked out in the scheme. It is -- designed on "separate System" principal in which storm water is excluded It is a net work of underground sewers, direct from the house to the outfall.

An allowance of 20 gallons per head per day is made for designing the size of the sewers

3 The scheme has been several times scrutinized by the technical officers of the Government, Messrs Krishna Iyengar, Cadambi and Bhore and they all have approved of the scheme as a whole Mr Bhore, the the Sanitary Engineer in his Note in the year 1919 raises one important point on the question of one common outfall or several outfalls to avoid pumping, which is worth considering from the point of view of the cost and maintenance of the scheme

4 I would like to draw attention to two most important points of the scheme viz , (1) flushing and (2) method of lifting the sewage, o which points I have tried to give expression to my humble views in t matter as follows

5 The success of an underground sewerage system depends upon a ample and effective flushing arrangement For a place like India, -- where all sorts of things are often found in the sewers owing to --- habits and customs of the people, the provision of ample flushing is of more vital importance in Eastern Cities than in Western ones It no use saddling the Municipality with a costly sewerage system, if they cannot get water to flush the sewers. The present scarcity o water and the inadequate supply which we are having are a great sou of hindrance to a successful working of a sewerage scheme Unless present water supply is improved and a guarantee is given that wa

will be supplied for flushing purposes, I would not recommend the scheme to be taken on hand. I would prefer to defer it till an ample water supply is guaranteed. Till to-day they have not given water -- for flushing purposes, in Mysore for its Drainage and Sewerage scheme which was installed some 12 years ago.

In this Scheme Mr.D'Cruz has provided the use of waste waters under public fountains for flushing. No doubt it is a good idea to make use of waste waters in this way, but in addition to this we want regular flushing My experience in Mysore where such flush tanks -- were erected under public fountains isthat they contain lot of solids such as pebbles, rags, sand, ashes &c., which are likely to be washed down the sewers very often. I am inclined to think they after all - do not serve the purpose well.

6. Another point in the scheme worth considering is whether to have a common outfal or several outfalls. If one outfall is decided upon as is done by the originator of the scheme, Mr. D'Cruz, then --- there is no other alternative but pumping from portions which cannot gravitate to the main outfall. A pumping ~~xxx~~ scheme is costly both in its original cost and in its recurring maintenance charges. But if the sewage is allowed to gravitate in its natural valley and treated on land on the outskirts or several outfalls - the scheme becomes -- more simple and less complicated - less costly in its initial expense and in its maintenance and more easy for the Municipality to look -- after it than with a number of ejector stations and air compressing plant. But no doubt it will not be an ideal thing. For compactness of the scheme and from a health point of view, one common outfall is the best. Several outfalls scattered round about the City are likely to be neglected than one common outfall. I have the sad experience to see the several outfall works with their purification plants fall entirely into disrepairs in Mysore owing to the neglect of the --- Municipality.

7. Having decided upon one outfall, lifting of the sewage from those portions which cannot gravitate to the common outfall becomes inevitable. To do this Mr. D'Cruz had adopted in his scheme shaft

ejectors worked by compressed air, to lift the sewage. There is a difference of opinion about this method Some advocate electrically driven motor pumps in place of Shone's ejectors The reasons given by Mr D'Cruz in adopting Shone's ejectors in preference to motor pumps is that (1) it would be less costly to maintain than 7 motors and pumps with a separate staff for each to work them, (2) that the wear on the ejectors would also be practically negligible when compared with the wear on any kind of pump &c

The shone's Hydro-pneumatic ejector system is adopted in --- Rangoon, Karachi and Bombay In Rangoon there are nearly 26 ejector chambers, with 52 ejectors most of the ejectors being 200 gallons capacity The total cost of the sewerage scheme, on shone system came to nearly 23 5 lacs In Karachi, they first tried 5 blocks each with an ejector and the installation has given so much satisfaction that, the system is adopted for the whole town Mr James, once the Drainage Engineer of Bombay says " from a purely sanitary point of view, the shone system is the theoretically perfect, for the sewage is rapidly removed in a fresh state from the inhabited portions of the town to the ejectors, but inspite of this undesirable advantage it is not without some drawbacks" He also says that this system which has been introduced into several districts of the City of Bombay has so far proved very successful in working In recent installations, the defects learnt by experience in actual working are gradually removed and the designs of ejectors are improved on The above installations were put up some 20 to 30 years ago

In this connection, I would suggest that the Municipalities of Bombay, Karachi and Rangoon, may be consulted and their opinion obtained as to the suitability and the working of these ejectors, before this scheme is finally adopted

The materials proposed to be used in the scheme are stone in cement mortar, cement concrete, cast iron and stoneware-materials which resist the action of sewage and foul gases and which are al-

ways

always used in first class sewerage works As bricks are known to deteriorate by the action of sewage, the manholes are proposed to be constructed of stone in cement mortar instead of brick in mortar as is usually done - plastered inside with cement mortar for a height of 2' only - I would prefer to plaster the whole -- inside instead of only 2 feet

(9 Another important point on which I would like to lay --- stress upon is the internal drainage of the houses What is the use of a costly sewerage scheme if half of the quantity of sewage is allowed to soak within the compounds of the houses In Mysore, when I was incharge of the sewerage works , I found that nearly 80% of the houses had neither watertight sinks to bath rooms or impervious floors or watertight drains to lead the foul water to the road side drains or street sewers Nearly half the quantity of -- water fouled after use was soaking then and there either in the backyard or the room before it reached the outside drain If connection are given from such houses without improving the internal condition, it will bring in lot of mud and sand which will ultimately block up the sewers The Municipal control in this respect is very weak, is what I have noticed during my tenure of office in the Mysore Trust Board There must be some sort of Regulation by the Municipality to compel the owners of the houses to bring out the foul water of - their houses in watertight channels or drains under the professional advice of the Engineer of the Municipality. The full beneficial -- effects of costly sanitary improvements will not have marked influence on the public health if this is not attended to side by side.

10 I am of the opinion that before the scheme is sanctioned, the Municipality must give genuine guarantee to maintain and up-keep this complicated system of sewerage by employing a professional man who thoroughly understands both the theoritical and practical side of the system In order to keep these works in a state of highest efficiency it requires great care, attention and knowledge of detail on the part of the man in charge, We have not got to go far to se

the state of affairs due to neglect and want of technical knowledge on the part of the Municipality In Mysore all the outfall works are in a state of disrepairs - In Bangalore too some of the out-fall works constructed by Mr. Bhore the then Sanitary Engineer are neglected as stated in Mr. D'Cruz's report.

To quote the words of an eminent authority "The Engineers -- responsible for the design and construction of sewage disposal works may often be heard to deplore the fact that directly the works are finished, their management is too frequently handed over to an untrain -ed man who really gains experience from the mistakes he makes while the works are flamed for the disappointing results obtained when they are chiefly due to mismanagement" How far these remarks are applicable to our Municipalities is an open secret.

11 Having been in charge of the designing and construction of -- Mysore sewerage system for a number of years, I emphatically lay --- stress on the above points which are of vital importance to the ---- success of the scheme, Viz , (1) flushing (2) internal house drainage and (3) management and upkeep, from the experience I had gained there The outfall works there are into despairs and the conditions of sewers and drains notorious and through earthen house drains mud and sand pass into the sewers and ultimately choke them I therefore say with some confidence that (1) unless and until an adequate Water Supply is guaranteed to flush the sewers (2) unless and until the Municipality compels through legislation, the house owners to bring out the waste waters of their houses through impervious drains and (3) unless and until the Municipality guarantees to employ a technical Officer to look after and maintain this complicated sewerage --- system, I would hesitate to launch such a costly sanitary measure -- whose beneficial effect could be hardly compared with the enoromous sum to be spent on it

Sd H. F Marker,

Executive Engineer,
Spl S Constn. Division

"Copy"

For Chief Engineer of Mysore.

Note on the City Drainage Scheme, Bangalore.

******

A complete scheme of drainage for the old City was originally prepared by the Sanitary Engineer involving an expenditure of Rs. ten lakhs. As regards financing the scheme, Government in their Order No. 1297-347/Ml. 112-14-13, dated the 13th August 1915, promised to contribute one-half of this cost, if the Municipal Council arranged to bear the ~~remainder~~ remainder. But the preparation of a fresh comprehensive scheme of drainage of the old City including its extensions under the Supervision of Mr. J.E.A. D'Crus late Executive Engineer of the State, P.W.D. was sanctioned in Government Order No. 6461-4/Ml. 111-15-17, dated 3rd March 1916.

The detailed scheme prepared by Mr. D'Cruz was estimated to cost Rs. 18½ lakhs and consisted of 8 drainage areas which admitted of being taken in parts

3 This scheme was scrutinised by the Chief Engineer, who was of opinion that that was complete and might be sanctioned, and that it would be sufficient to take only a portion pertaining to the City proper and Fort costing Rs.12,04,494 As regards financing the scheme, the Municipal Council wanted the entire cost to be borne by Government, while Government were of opinion that their offer to

bear half the cost conveyed in their -- order of the 3rd ~~March~~ August 1915 was a li- - beral concession and informed the Municipal Council that unless and until - - they were able to find funds for meeting a moiety of the cost out of their own funds, the schemes would have to be - - held up.

After a long correspondence the -- Municipal Council finally agreed to pay up the moiety of the cost out of their own funds.

In the meanwhile, the then Chairman of the City Improvement Committee, Bangalore, in his letter No. 264, dated -- the 6th February 1920 requested sanc- - tion to the immediate construction and laying of portions of the sewerage main and submains required for sewering the New General Market, the New Bamboo Bazaar, Town Hall etc , at a cost of - Rs. 1,20,820.

The drainage scheme as a whole as well as the part scheme which the Municipality wanted to be taken up at once, was duly scrutinised by Mr. G V. Rao, the then Drainage and Water Supply Engineer.

In this office letter No. R.9474- Ml.91-17-31, dated the 24th February - 1921, the President, Bangalore City Municipal Council was requested to furnish detailed information regarding the

ways and means for meeting the Municipa quota of the initial cost of the scheme - and also the maintenance charges thereof and he was also therein asked to state -- whether the Municipal Council would be -- prepared to start at once the execution - from their own funds, of the part scheme - at a cost of Rs. 1,20,820, in view of the fact that the entire drainage scheme involving an outlay of about Rs. 19 lakhs - was not likely to be sanctioned early

C

The President in his letter No. 222, dated the 3rd May 1921 reported that the Municipal Council could only meet ~~them~~ -- half the costof the part scheme as in the case of the whole scheme and promised to make a separate reference regarding the - qestion of financing the Municipal share of the initial as well as the maintenance charges of the entire scheme

As Government were then, unable to -- contribute anything even towards their -- moiety of the cost of the part scheme -- owing to the financial stringency, the -- question of the drainage scheme of the -- City as a whole and the part scheme ~~were~~ ordered to lie over.

P

Q

The Municipal Council in their budget for 1923-24 made a provision of - - ~~[illegible]~~ Rs. 1 lakh for the drainage of the City and sought for the sanction - of Government to the entire drainage --- scheme costing Rs. 19 lakhs. Thereupon Government directed that it might con- -

tinue to lie over till State finances improved (Vide L.8050/Ml.188-22-2, -- dated the 14th June 1923).

R

The Municipal Council in their - budget for the current year also made a provision of Rs. 2 lakhs for starting City Drainage Scheme during this year and they expected an additional grant of Rs. 1 lakh from Government - on this account. But on account of the present financial stringency, the drainage scheme was ordered to be - - kept in abeyance until the State - - finances improve.

S (Para 5)

While reviewing the work done in connection with the Bangalore City -- Improvements from the beginning of -- its operations in the year 1889 till the end of 1918-19, Government have - in para 11 of their Order No. 5682-7Ra Ml.1-19-2, dated the 14th November -- 1919 permitted the City Municipal - - Cpuncil of Bangalore to raise a loan for financing their share of the cost of the City Drainage Scheme, in case - they are unable to find funds out of their growing revenues

J

S (Para 6)

The financial condition of the - City Municipal Council as per current year's budget is as follows -

Opening balance	...	...	Rs 38,637
Receipts -			
Special	. Rs. 4,45,000		
Normal.	. Rs. 5,43,423		
			Rs. 9,88,423
	T o t a l		Rs. 10,27,060

Expenditure -

Total.		Rs. 10,27,060
Expenditure.-		
Special. . .	.. Rs. 2,71,000	
Normal.	Rs. 5,86,885	
		Rs. 8,57,885
CLOSING BALANCE		Rs 1,69,175

exclusive of the Fixed Deposit of - Rs 2,70,000 in the Mysore Bank

The normal expenditure being in excess of the normal income by Rs. 43,000 - the financial position of the Municipal - Council does not seem to be sound and - - moreover they have to pay out of their -- normal revenues the entire charges for -- the maintenance of the City Water Works - from the current year as per Goverment - Order No. L 6058-65 / Ml 17619-25 dated 19th April 1926

In the above circumstances the Municipal Council do not seem to be in a position to find funds for the Drainage Scheme from their normal revenues and they will - have therefore to go in for a loan in the open market, which is a matter for consideration

23/5/24

28/5/24

E.W.M/4.

Unless a loan is raised, it is difficult to finance the scheme. The scheme can be worked on piecemeal. (Engineer)

The municipal council may perhaps be asked whether it is not possible to raise the necessary loan to carry out the scheme -

Secretary.

23/5